

Cortical control of motor actions

1- Mention the characteristics of the topographical presentation of the primary cortex?

The body part represent upside down.* upper part of the face (forhead) represent bilaterally .areas which represent parts of the body are directly related to the skills done by this parts.

2- What are the function of secondary cortical area?

Both function in programming of the motor activity and coordinating the movements of arms ,hand, head and eyes ,also they help in fixation movements of the different body parts to allow the exact movement.

*.premotor area :stores memories of learned actions , inhibits grasp reflex

*. Supplementary area : bilateral coordination ,knowing of position of body in space

3- If the patient has the following symptoms where is the lesion?

-motor apraxia -reapearing of grasp reflex

-loss of bimanual coordination -defective orientation of body in space

The lesion is in area 6 (secondary cortical areas)

4- Mention the specific secondary motor areas that perform specific function?

*. Broca area : word formation area *.eye movement area *.head rotation area *.area for hand skill

5- Is the topographical representation of the body parts in the cortex fixed?

No,, they increase by practice and learning

6- Define pyramidal and extrapyramidal tracts?

*. Pyramidal tracts also called corticospinal tract : is a direct pathway of cortical fibers between the pyramidal nuecli in the primary cortex and anterior motor neurons in spinal cord

*. Extrapyramidal tract : is indirect pathway because cortical fibers pass and branch to many areas such as the parts of brain stem and basal ganglia before it reaches to spinal cord

7- For the corticospinal tract where does the decossation occur and where they terminate in the spinal cord?

Decussation of fibers occur in the lower border of medulla near to the spinal cord , the fibers teriminate in the interneuron and anterior motor neuron

8- Define the lateral and medial motors system and their functions?

*. Lateral motor system = lateral corticospinal tract + rubrospinal tract of medbrain.

Functions to control of distal limbs muscles .

*. Medial (ventral) motor system =medial corticospinal tract + other extrapyramidal tract

Functions to control of proximal and axial muscles .

9- Define the upper and lower motor neroun and give examples for lesions in each one of them?

*. Upper motor neuron : all neuron found in higher centers – cortex , brain stem ,cerebellar cortex ,basal ganglia

Lesions hear cause hemiplegia and extrapyramidal syndrome

*. Lower motor neuron : motor neuron in spinal cord

Lesions hear effect contraction of related muscles

comparison

Muscle tone	U M N lesions Hypertonia due to absence of inhibition of motor neuron in spinal cord by UMN	LMN lesions Hypotonia due to inability of motor neuron to cause contraction of the muscle
Stretch reflexes	Hyperreflexia due to hyperactivation of motor neuron because of the absence of UMN	Hyporeflexia
Muscle wasting	Slightly due to presence of muscle tone	Severe due to absence of muscle tone so no metabolism found
Babinski sign	Positive due to hyperreflexia	negative

questions in the last slide of the lecture

Lesion in the UMN because it is paralysis of upper and lower limb, and it is the left side due to crossing of the fibers to the opposite side

Explanation of the mechanism : these signs arise from the lesion in the left part of UMN so paralysis occur in the right limbs and the right side of the face which lead to deviation of the mouth to the left , reflexes and the presence of hypertonic muscles due to absence of inhibition of motor neuron in the spinal cord by UMN so hyperactivation occur to spinal motor .

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